

Appl. No. 09/405,189

Amendment and Response dated August 26, 2003

Reply to Office Action of March 26, 2003

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (currently amended) A composition comprising:

about ~~0.05~~ 0.01 wt-% to about ~~95.0~~ 10 wt-% mono-or-diester dicarboxylate,

about ~~0.05~~ 0.01 wt-% to about ~~90.0~~ 10 wt-% hydrogen peroxide, and

about ~~10.0~~ 90 wt-% to about 99.98 wt-% water;

wherein the composition exhibits antimicrobial activity against *Bacillus cereus*, *Bacillus subtilis*, or *Chaetomium funicola* upon contacting the microbe with the composition for at least 5 seconds at a temperature between about 0 °C and about 100 °C.

2. (currently amended) The composition of claim 1, comprising:

about 0.1 wt-% to about ~~50~~ 7 wt-% mono-or-diester dicarboxylate,

about 0.1 wt-% to about ~~25~~ 7 wt-% hydrogen peroxide, and

about ~~20~~ 92 wt-% to about 99 wt-% water,

3. (currently amended) The composition of claim 1, comprising:

about ~~0.1~~ wt-% to about ~~10~~ 5 wt-% mono-or-diester dicarboxylate,

about ~~0.1~~ wt-% to about ~~10~~ 4 wt-% hydrogen peroxide, and

about ~~30~~ 95 wt-% to about 99 wt-% water.

4. (currently amended) The composition of claim 1, comprising:

about ~~50~~ 3 wt-% mono- or diester dicarboxylate,

about ~~25~~ 2 wt-% hydrogen peroxide, and

about ~~25~~ 90 to about 95 wt-% water.

5. (currently amended) The composition of claim 1, ~~comprising~~ wherein the mono-

or-diester dicarboxylate comprises monomethyl malonate, dimethyl malonate, monoethyl

malonate, diethyl malonate, monopropyl malonate, dipropyl malonate, monobutyl malonate,

Appl. No. 09/405,189
Amendment and Response dated August 26, 2003
Reply to Office Action of March 26, 2003

dibutyl malonate, diamyl malonate, dihexyl malonate, di-2-ethylhexyl malonate, monomethyl succinate, dimethyl succinate, monoethyl succinate, diethyl succinate, monopropyl succinate, dipropyl succinate, monobutyl succinate, dibutyl succinate, diamyl succinate, dihexyl succinate, di-2-ethylhexyl succinate, monomethyl glutarate, dimethyl glutarate, monoethyl glutarate, diethyl glutarate, monopropyl glutarate, dipropyl glutarate, monobutyl glutarate, dibutyl glutarate, diamyl glutarate, dihexyl glutarate, di-2-ethylhexyl glutarate, monomethyl adipate, dimethyl adipate, monoethyl adipate, diethyl adipate, monopropyl adipate, dipropyl adipate, monobutyl adipate, dibutyl adipate, diamyl adipate, dihexyl adipate, di-2-ethylhexyl adipate, monomethyl sebacate, dimethyl sebacate, monoethyl sebacate, diethyl sebacate, monopropyl sebacate, dipropyl sebacate, monobutyl sebacate, dibutyl sebacate, diamyl sebacate, dihexyl sebacate, di-2-ethylhexyl sebacate, or a mixture thereof.

6. (currently amended) The composition of claim 5, comprising wherein the mono-or-diester dicarboxylate comprises dimethyl malonate, diethyl malonate, dipropyl malonate, dibutyl malonate, diamyl malonate, dihexyl malonate, di-2-ethylhexyl malonate, dimethyl succinate, diethyl succinate, dipropyl succinate, dibutyl succinate, diamyl succinate, dihexyl succinate, di-2-ethylhexyl succinate, dimethyl glutarate, diethyl glutarate, dipropyl glutarate, dibutyl glutarate, diamyl glutarate, dihexyl glutarate, di-2-ethylhexyl glutarate, dimethyl adipate, diethyl adipate, dipropyl adipate, dibutyl adipate, diamyl adipate, dihexyl adipate, di-2-ethylhexyl adipate, dimethyl sebacate, diethyl sebacate, dipropyl sebacate, dibutyl sebacate, diamyl sebacate, dihexyl sebacate, di-2-ethylhexyl sebacate, or a mixture thereof.

7. (currently amended) The composition of claim 6, wherein the mono-or-diester dicarboxylate comprises dimethyl oxalate, dimethyl malonate, dimethyl succinate, dimethyl adipate, dimethyl sebacate, diethyl oxalate, diethyl malonate, diethyl succinate, diethyl glutarate, diethyl adipate, diethyl sebacate, dipropyl oxalate, dipropyl malonate, dipropyl succinate, dipropyl glutarate, dipropyl adipate, dipropyl sebacate, dibutyl oxalate, dibutyl malonate, dibutyl succinate, dibutyl glutarate, dibutyl adipate, dibutyl sebacate, diamyl succinate, diamyl sebacate, dihexyl succinate, dihexyl sebacate, diethylhexyl succinate, diethylhexyl sebacate, or a mixture thereof.

Appl. No. 09/405,189

Amendment and Response dated August 26, 2003

Reply to Office Action of March 26, 2003

8. (currently amended) The composition of claim 1, comprising about 0.05 wt-% to about ~~50.0~~ 7 wt-% diester dicarboxylate.

9. (currently amended) The composition of claim 8, comprising about 0.1 wt-% to about ~~20.0~~ 5 wt-% diester dicarboxylate.

10. (canceled)

11. (currently amended) The composition of claim 1, comprising about 0.05 wt-% to about ~~50.0~~ 7 wt-% hydrogen peroxide.

12. (currently amended) The composition of claim 1, comprising about 0.1 wt-% to about ~~25.0~~ 4 wt-% hydrogen peroxide.

13. (canceled)

14. (canceled)

15. (currently amended) The composition of claim 1, comprising about ~~20.0~~ 92 wt-% to about ~~99.0~~ wt-% water.

16. (currently amended) The composition of claim 1, comprising about ~~30.0~~ 95 wt-% to about ~~99.0~~ 97 wt-% water.

17. (original) The composition of claim 1, further comprising a stabilizing agent.

18. (currently amended) The composition of claim 17, wherein the ~~stabilizer~~ comprises the ~~stabilizer~~ stabilizing agent comprises a phosphonic acid, a dipicolinic acid, a picolinic acid, a gluconic acid, a quinolinic acid, an ethylenediamine tetraacetic acid (EDTA), an

Appl. No. 09/405,189

Amendment and Response dated August 26, 2003

Reply to Office Action of March 26, 2003

hydroxyethylethylene diamine triacetic acid (HEDTA), an ethylene triaminepentaacetic acid, a polyacrylic acid, a salt thereof, or a mixture thereof.

19. (original) The composition of claim 18, wherein the phosphonate comprises 1-hydroxy ethylidene-1,1-diphosphonic acid ($\text{CH}_3\text{C}(\text{PO}_3\text{H}_2)_2\text{OH}$) (HEDP), amino[tri(methylene phosphonic acid)] ($[\text{CH}_2\text{PO}_3\text{H}_2]_3$ (ethylene diamine[tetra methylene-phosphonic acid])), 2-phosphene butane-1,2,4-tricarboxylic acid, an alkali metal salt thereof, an ammonium salt thereof, an alkyloyl amine salt thereof, or a mixture thereof.

20. (currently amended) The composition of claim 19, wherein the alkyloyl amine salt comprises a monoethanol amine salt, a diethanolamine salt, a ~~tetraethanolamine~~ triethanolamine salt, or a mixture thereof.

21. (original) The composition of claim 1, wherein the composition is free of added strong inorganic acid.

22. (canceled)

23. (currently amended) The composition of claim 1, wherein, ~~when diluted by at least about 1.0 fold,~~ the ~~diluted~~ composition exhibits at least 1.0 \log_{10} microbial reduction against *Bacillus cereus*, *Bacillus subtilis*, or *Chaetomium funicola* upon contacting the microbe with the composition for at least 5 seconds at a temperature between about 20 °C to and about 65 °C.

24. (currently amended) A method for making an antimicrobial composition, comprising:

adding hydrogen peroxide to a vessel;

adding mono- or diester dicarboxylate to a vessel;

mixing the hydrogen peroxide and the mono- or diester dicarboxylate in the vessel;

Appl. No. 09/405,189
Amendment and Response dated August 26, 2003
Reply to Office Action of March 26, 2003

retaining the hydrogen peroxide and the mono- or diester dicarboxylate in the vessel for a duration of from about 0.05 minutes to no more than about 21 days; and

diluting the retained and mixed hydrogen peroxide and mono- or diester dicarboxylate composition to form an use antimicrobial composition comprising:

about 0.01 wt-% to about 10 wt-% mono-or-diester dicarboxylate,

about 0.01 wt-% to about 10 wt-% hydrogen peroxide, and

about 90 wt-% to about 99.98 wt-% water;

wherein the composition exhibits antimicrobial activity against *Bacillus cereus*, *Bacillus subtilis*, or *Chaetomium funicola* upon contacting the microbe with the composition for at least 5 seconds at a temperature between about 0 °C and about 100 °C.

25. (original) The method of claim 24, further comprising removing a portion of the retained and mixed hydrogen peroxide and mono- or diester dicarboxylate composition from the vessel for diluting.

26. (original) The method of claim 24, comprising continuously, or semi-continuously, adding hydrogen peroxide and alternately continuously, or semi-continuously, adding mono-or-diester dicarboxylate to the vessel.

27. (original) The method of claim 26 where hydrogen peroxide is added continuously, or semi-continuously, without adding additional mono-or-diester dicarboxylate to the vessel.

28. (original) The method of claim 26, further comprising removing a portion of the retained and mixed hydrogen peroxide and mono-or-diester dicarboxylate composition from the vessel for diluting.

29. (original) The method of claim 24, comprising batch wise adding hydrogen peroxide and batch wise adding mono- or diester dicarboxylate to the vessel.

Appl. No. 09/405,189

Amendment and Response dated August 26, 2003

Reply to Office Action of March 26, 2003.

30. (original) The method of claim 24, comprising batch wise removing a portion of the retained and mixed hydrogen peroxide and mono- or diester dicarboxylate composition from the vessel for diluting.

31. (currently amended) The method of claim 24, comprising:
adding mono- or diester dicarboxylate and aqueous hydrogen peroxide to achieve a composition comprising:

about 0.05 wt-% to about 50.0 wt-% mono-or-diester dicarboxylate,
about 0.05 wt-% to about 50.0 wt-% hydrogen peroxide, and
~~about 10.0 wt-% to about 99.98 wt-% water.~~

32. (currently amended) The method of claim 24, comprising:
achieving a composition comprising:

about ~~50~~ 1 to about 4 wt-% mono- or diester dicarboxylate,
about ~~25~~ 1 to about 4 wt-% hydrogen peroxide, and
about ~~25~~ 95 to about 99 wt-% water.

33. (currently amended) A method of reducing population of microorganism on an object, comprising:

contacting the object with use composition of *in situ* composition;
the *in situ* composition comprising:

about 0.01 wt-% to about ~~30.0~~ 10 wt-% mono- or diester dicarboxylate,
about 0.01 wt-% to about ~~30.0~~ 10 wt-% hydrogen peroxide, and
about ~~10.0~~ 90 wt-% to about 99.98 wt-% water;

wherein the composition exhibits antimicrobial activity against *Bacillus cereus*, *Bacillus subtilis*, or *Chaetomium funicola* upon contacting the microbe with the composition for at least 5 seconds at a temperature between about 0 °C and about 100 °C.

34. (canceled)

Appl. No. 09/405,189
Amendment and Response dated August 26, 2003
Reply to Office Action of March 26, 2003

35. (original) The method of claim 33, wherein the microorganism is a fungus.
36. (original) The method of claim 33, wherein the microorganism is of the genus *Chaetomium*.
37. (original) The method of claim 33, wherein the microorganism is of the genus *Arthrrium*.
38. (original) The method of claim 33, wherein the microorganism is of the genus *Bacillus*.
- AI 39. (original) The method of claim 33, comprising contacting with use composition effective to reduce by more than 1-log order the population of spores and/or cells of *Bacillus cereus* within 10 seconds at 60° C.
40. (original) The method of claim 33, comprising contacting with use composition effective to reduce by more than 1-log order the population of cells of *Chaetomium funicola* within 10 seconds at 60° C.
41. (original) The method of claim 33, comprising contacting with use composition effective to reduce by more than 1-log order the population of spores and/or cells of *Chaetomium funicola* and *Bacillus cereus* within 10 seconds at 60° C.
42. (original) The method of claim 33, comprising contacting hard surface, soft surface, porous surface, food substance, or skin.
43. (original) The method of claim 33, comprising contacting food, beverage, or pharmaceutical packaging.

Appl. No. 09/405,189

Amendment and Response dated August 26, 2003

Reply to Office Action of March 26, 2003

44. (original) The method of claim 43, comprising contacting aseptic food, beverage, or pharmaceutical packaging.

45. (original) The method of claim 33, comprising contacting all or part of a food, beverage, or pharmaceutical plant.

46. (original) The method of claim 33, comprising contacting tank, pipe, line, pump, valve, or other mixing or fluid transport apparatus.

47. (currently amended) A method for cold aseptic bottling of food, beverages, or pharmaceuticals, the method comprising:

contacting a beverage container with ~~an use composition of an~~ *in situ* composition for sufficient period of time to reduce the microorganism population;

the *in situ* composition comprising:

about 0.01 wt-% to about ~~25.0~~ 10 wt-% mono-or-diester dicarboxylate,

about 0.01 wt-% to about ~~35.0~~ 10 wt-% hydrogen peroxide, and

about ~~10.0~~ 90 wt-% to about 99.98 wt-% water;

wherein the composition exhibits antimicrobial activity against *Bacillus cereus*, *Bacillus subtilis*, or *Chaetomium funicola* upon contacting the microbe with the composition for at least 5 seconds at 0 °C to 100 °C;

filling the container with a beverage, food, or pharmaceutical;

sealing the filled container;

wherein contacting obtains a significantly reduced population of microorganisms resulting in a sanitized food, beverage, or pharmaceutical container.